

Search Plan and Results

Question

[What is the relationship between whole grain intake and cardiovascular disease? \(DGAC 2010\)](#)

[What is the relationship between whole grain intake and type 2 diabetes? \(DGAC 2010\)](#)

[What is the relationship between whole grain intake and body weight? \(DGAC 2010\)](#)

Date Searched

July 2009, September 2009, November 2009

Inclusion Criteria

- Human subjects
- English language
- International
- *Sample size:* Minimum of 10 subjects per study arm; preference for larger sizes, if available
- *Dropout rate:*
- *Ages:* Children, two to 18 years; adults, 19 years and older
- *Populations:* Healthy
- *Study design:* Systematic review, meta-analysis, clinical trial, prospective cohort. Cross-sectional studies were included for weight question.

Exclusion Criteria

- Medical treatment or therapy
- Diseased subjects (already diagnosed with disease related to study purpose)
- Hospitalized patients
- Malnourished or third-world populations or disease incidence not relative to US population (e.g., malaria)
- Animal studies
- In vitro studies
- *Study design:* Cross-sectional, case control
- Articles not peer reviewed (web sites, magazine articles, Federal reports, etc.).

Search Terms: Search Vocabulary

- (Whole grain* OR cereal[mh] OR amaranth OR barley OR buckwheat OR corn OR maize OR millet OR oats OR quinoa OR rice OR rye OR sorghum OR teff OR triticale OR wheat OR spelt OR emmer OR farro OR einhorn OR kamut OR

- durum OR bran) AND ("CARDIOVASCULAR DISEASES"[mesh] OR "Diabetes Mellitus OR "Type 2"[Mesh]) NOT (Editorial[ptyp] OR Letter[ptyp])
- Whole grain* OR cereal[mh]) AND ((("overweight"[mh] OR "Body Weights and Measures"[mh])
 - Whole grain* AND (intake or consumption) AND "published last 10 years"[Filter] AND "english and humans"[Filter]
 - (Whole grain* OR cereal[mh] OR amaranth OR barley OR buckwheat OR corn OR maize OR millet OR oats OR quinoa OR rice OR rye OR sorghum OR teff OR triticale OR wheat OR spelt OR emmer OR farro OR einhorn OR kamut OR durum OR bran) AND ("CARDIOVASCULAR DISEASES"[mesh] OR "Diabetes Mellitus, Type 2"[Mesh]) AND (systematic[sb] OR Meta-Analysis[ptyp] OR "Trial"[Mesh] OR "Cohort Studies"[Mesh]) NOT (Editorial[ptyp] OR Letter[ptyp]).

Electronic Databases

PubMed.

Total hits from all electronic database searches: 888

Total articles identified to review from electronic databases: 89

Articles Identified Via Handsearch or Other Means

Hand Search (one study):

Brownlee IA, Moore C, Chatfield M, Richardson DP, Ashby P, Kuznesof SA, Jebb SA, Seal CJ. [Markers of cardiovascular risk are not changed by increased whole-grain intake: The WHOLEheart study, a randomised, controlled dietary intervention.](#) Br J Nutr. 2010 Mar 23 :1-10. PMID: 20307353.

Summary of Articles Identified to Review

Number of Primary Articles Identified: 11

Number of Review Articles Identified: 7

Total Number of Articles Identified: 18

Number of Articles Reviewed but Excluded: 72

List of Articles Included for Evidence Analysis

Cardiovascular Disease

Systematic Reviews and Meta-analyses:

De Moura FF, Lewis KD, Falk MC. [Applying the FDA definition of whole grains to the evidence for cardiovascular disease health claims.](#) *J Nutr.* 2009 Nov; 139 (11): 2, 220S-2, 226S. Epub 2009 Sep 23. PMID: 19776180.

Kelly SA, Summerbell CD, Brynes A, Whittaker V, Frost G. [Wholegrain cereals for coronary heart disease.](#) *Cochrane Database Syst Rev.* 2007 Apr 18; (2): CD005051. Review. PMID: 17443567.

Mellen PB, Walsh TF, Herrington DM. [Whole grain intake and cardiovascular disease: A meta-analysis.](#) *Nutr Metab Cardiovasc Dis.* 2008 May; 18 (4): 283-290. Epub 2007 Apr 20. PMID: 17449231.

Primary Citations:

Brownlee IA, Moore C, Chatfield M, Richardson DP, Ashby P, Kuznesof SA, Jebb SA, Seal CJ. [Markers of cardiovascular risk are not changed by increased whole-grain intake: The WHOLEheart study, a randomised, controlled dietary intervention.](#) *Br J Nutr.* 2010 Mar 23 :1-10. PMID: 20307353. (Hand Search)

Djoussé L, Gaziano JM. [Breakfast cereals and risk of heart failure in the Physicians' Health Study I.](#) *Arch Intern Med.* 2007 Oct 22; 167 (19): 2, 080-2, 085. PMID: 17954802.

Flint AJ, Hu FB, Glynn RJ, Jensen MK, Franz M, Sampson L, Rimm EB. [Whole grains and incident hypertension in men.](#) *Am J Clin Nutr.* 2009 Sep; 90 (3): 493-498. Epub 2009 Jul 1. PMID: 19571218.

Nettleton JA, Steffen LM, Loehr LR, Rosamond WD, Folsom AR. [Incident heart failure is associated with lower whole-grain intake and greater high-fat dairy and egg intake in the Atherosclerosis Risk in Communities \(ARIC\) study.](#) *J Am Diet Assoc.* 2008 Nov; 108 (11): 1, 881-1, 887. PMID: 18954578; PMCID: PMC2650810.

Type 2 Diabetes

Systematic Reviews and Meta-analyses:

de Munter JS, Hu FB, Spiegelman D, Franz M, van Dam RM. [Whole grain, bran, and germ intake and risk of type 2 diabetes: A prospective cohort study and systematic review.](#) *PLoS Med.* 2007 Aug; 4 (8): e261. PMID: 17760498; PMCID: PMC1952203.

Priebe MG, van Binsbergen JJ, de Vos R, Vonk RJ. [Whole grain foods for the prevention of type 2 diabetes mellitus.](#) *Cochrane Database Syst Rev.* 2008 Jan 23; (1): CD006061. Review. PMID: 18254091.

Primary Studies:

Brownlee IA, Moore C, Chatfield M, Richardson DP, Ashby P, Kuznesof SA, Jebb SA, Seal CJ. [Markers of cardiovascular risk are not changed by increased whole-grain intake: The](#)

[WHOLEheart study, a randomised, controlled dietary intervention.](#) *Br J Nutr.* 2010 Mar 23; 1-10. PMID: 20307353. (Hand Search)

Kocher J, Djoussé L, Gaziano JM. [Breakfast cereals and risk of type 2 diabetes in the Physicians' Health Study I.](#) *Obesity (Silver Spring).* 2007 Dec; 15 (12): 3, 039-3, 044. PMID:18198313.

Weight, Adiposity and Obesity

Systematic Reviews and Meta-analyses:

Harland JI, Garton LE. Whole-grain intake as a marker of healthy body weight and adiposity. [Whole-grain intake as a marker of healthy body weight and adiposity.](#) *Public Helath Nutrition.* 2008 Jun; 11(6): 554-563. Epub 2007 Nov 16. PMID: 18005489.

Williams PG, Grafenauer SJ, O'Shea JE. [Cereal grains, legumes and weight management: A comprehensive review of the scientific evidence.](#) *Nutr Rev.* 2008 Apr; 66 (4): 171-182. Review. PMID: 18366531.

Primary Studies:

Behall KM, Scholfield DJ, Hallfrisch J. [Whole-grain diets reduce blood pressure in mildly hypercholesterolemic men and women.](#) *J Am Diet Assoc.* 2006 Sep; 106 (9): 1, 445-1, 449. PMID: 16963350.

Katcher HI, Legro RS, Kunselman AR, Gillies PJ, Demers LM, Bagshaw DM, Kris-Etherton PM. [The effects of a whole grain-enriched hypocaloric diet on cardiovascular disease risk factors in men and women with metabolic syndrome.](#) *Am J Clin Nutr.* 2008 Jan; 87 (1): 79-90. PMID: 18175740.

Lutsey PL, Jacobs DR Jr, Kori S, Mayer-Davis E, Shea S, Steffen LM, Szklo M, Tracy R. [Whole grain intake and its cross-sectional association with obesity, insulin resistance, inflammation, diabetes and subclinical CVD: The MESA Study.](#) *Br J Nutr.* 2007 Aug; 98 (2): 397-405. Epub 2007 Mar 29. PMID: 17391554.

McKeown NM, Yoshida M, Shea MK, Jacques PF, Lichtenstein AH, Rogers G, Booth SL, Saltzman E. [Whole-grain intake and cereal fiber are associated with lower abdominal adiposity in older adults.](#) *J Nutr.* 2009 Oct; 139 (10): 1, 950-1, 955. Epub 2009 Sep 2.

van de Vijver LP, van den Bosch LM, van den Brandt PA, Goldbohm RA. [Whole-grain consumption, dietary fibre intake and body mass index in the Netherlands cohort study.](#) *Eur J Clin Nutr.* 2009 Jan; 63 (1): 31-38. Epub 2007 Sep 26. PMID: 17895913.

List of Excluded Articles with Reason

Article (A-K)	Reason for Exclusion
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<p>Alminger M, Eklund-Jonsson C. Whole-grain cereal products based on a high-fibre barley or oat genotype lower post-prandial glucose and insulin responses in healthy humans. <i>Eur J Nutr.</i> 2008 Sep; 47 (6): 294-300. Epub 2008 Jul 16.</p>	<p>Does not answer questions. Measures postprandial response.</p>
<p>Alonso A, Beunza JJ, Bes-Rastrollo M, Pajares RM, Martínez-González MA. Vegetable protein and fiber from cereal are inversely associated with the risk of hypertension in a Spanish cohort. <i>Arch Med Res.</i> 2006 Aug; 37 (6): 778-786. PMID: 16824939.</p>	<p>Does not include whole grain in analyses.</p>
<p>Anderson JW, Hanna TJ, Peng X, Kryscio RJ. Whole grain foods and heart disease risk. <i>J Am Coll Nutr.</i> 2000 Jun; 19 (3 Suppl): 291S-299S. PMID: 10875600.</p>	<p>Publication is a narrative review.</p>
<p>Bazzano LA, Song Y, Bubes V, Good CK, Manson JE, Liu S. Dietary intake of whole and refined grain breakfast cereals and weight gain in men. <i>Obes Res.</i> 2005 Nov; 13 (11): 1, 952-1, 960. PMID: 1633912.</p>	<p>Included in Harland/Garton 2007 systematic review for weight question. Does not include CVD or T2D in analyses.</p>
<p>Behall KM, Scholfield DJ, Hallfrisch J. Comparison of hormone and glucose responses of overweight women to barley and oats. <i>J Am Coll Nutr.</i> 2005 Jun; 24 (3): 182-188.</p>	<p>Does not answer questions. Measures postprandial response to whole grain intake.</p>
<p>Behall KM, Scholfield DJ, Hallfrisch J. Diets containing barley significantly reduce lipids in mildly hypercholesterolemic men and women. <i>Am J Clin Nutr.</i> 2004 Nov; 80 (5): 1, 185-1, 193.</p>	<p>Study subjects had hypercholesterolemia.</p>
<p>Behall KM, Scholfield DJ, Hallfrisch J. Whole-grain diets reduce blood pressure in mildly hypercholesterolemic men and women. <i>J Am Diet Assoc.</i> 2006 Sep; 106 (9): 1, 445-1, 449.</p>	<p>Participants had hypercholesterolemia. However, for CVD question was included in De Moura, 2009.</p>
<p>Davy BM, Melby CL, Beske SD, Ho RC, Davrath LR, Davy KP. Oat consumption does not affect resting casual and ambulatory 24-hour arterial blood pressure in men with high-normal blood pressure to stage I hypertension. <i>J Nutr.</i> 2002 Mar; 132 (3): 394-398. PMID: 11880561.</p>	<p>For CVD question: Included in De Moura, 2009. Does not include T2D or weight in analyses.</p>
<p>Erkkilä AT, Herrington DM, Mozaffarian D, Lichtenstein AH. Cereal fiber and whole-grain intake are associated with reduced progression of coronary-artery atherosclerosis in postmenopausal women with coronary artery disease. <i>Am Heart J.</i> 2005 Jul; 150 (1): 94-101.</p>	<p>Study subjects had coronary artery disease.</p>

<p>Flight I, Clifton P. Cereal grains and legumes in the prevention of coronary heart disease and stroke: A review of the literature. <i>Eur J Clin Nutr</i>. 2006 Oct; 60 (10): 1, 145-1, 159. Epub 2006 May 3. Review. PMID: 16670693.</p>	<p>Publication is a narrative review; the literature search was systematic.</p>
<p>Fung TT, Hu FB, Pereira MA, Liu S, Stampfer MJ, Colditz GA, Willett WC. Whole-grain intake and the risk of type 2 diabetes: A prospective study in men. <i>Am J Clin Nutr</i>. 2002 Sep; 76 (3): 535-540. PMID: 12197996.</p>	<p>For T2D question: Included in systematic reviews de Munter, 2007 and Priebe, 2008. Does not include CVD or weight in analyses.</p>
<p>Giacco R, Brightenti F, Parillo M, Capuano M, Ciardullo AV, Rivieccio A, Rivellese AA, Riccardi G. Characteristics of some wheat-based foods of the Italian diet in relation to their influence on postprandial glucose metabolism in patients with type 2 diabetes. <i>Br J Nutr</i>. 2001 Jan; 85 (1): 33-40. PMID: 11227031.</p>	<p>Study subjects were type 2 diabetics.</p>
<p>Good CK, Holschuh N, Albertson AM, Eldridge AL. Whole grain consumption and body mass index in adult women: An analysis of NHANES 1999-2000 and the USDA pyramid servings database. <i>J Am Coll Nutr</i>. 2008 Feb; 27 (1): 80-87. PMID: 18460485.</p>	<p>For weight question, included in Harland/Garton 2007 systematic review. Does not include CVD or weight in analyses.</p>
<p>Granfeldt Y, Nyberg L, Björck I. Muesli with 4g oat beta-glucans lowers glucose and insulin responses after a bread meal in healthy subjects. <i>Eur J Clin Nutr</i>. 2008 May; 62 (5): 600-607. Epub 2007 Apr 4.</p>	<p>Does not include outcomes of interest analyses. Measures postprandial response.</p>
<p>Harder H, Tetens I, Let MB, Meyer AS. Rye bran bread intake elevates urinary excretion of ferulic acid in humans, but does not affect the susceptibility of LDL to oxidation ex vivo. <i>Eur J Nutr</i>. 2004 Aug; 43 (4): 230-236. Epub 2004 Jan 6.</p>	<p>Does not include outcomes of interest in analyses.</p>
<p>Hsu TF, Kise M, Wang MF, Ito Y, Yang MD, Aoto H, Yoshihara R, Yokoyama J, Kunii D, Yamamoto S. Effects of pre-germinated brown rice on blood glucose and lipid levels in free-living patients with impaired fasting glucose or type 2 diabetes. <i>J Nutr Sci Vitaminol (Tokyo)</i>. 2008 Apr; 54 (2): 163-168.</p>	<p>Study subjects had impaired fasting glucose or T2D.</p>
<p>Jacobs DR Jr, Gallaher DD. Whole grain intake and cardiovascular disease: A review. <i>Curr Atheroscler Rep</i>. 2004 Nov; 6 (6): 415-423.</p>	<p>Publication is a narrative review.</p>

<p>Jacobs DR Jr, Meyer KA, Kushi LH, Folsom AR. Is whole grain intake associated with reduced total and cause-specific death rates in older women? The Iowa Women's Health Study. <i>Am J Public Health</i>. 1999 Mar; 89 (3): 322-329. PMID:10076480; PMCID: PMC1508593.</p>	<p>For CVD question: included in De Moura, 2009. Does not include T2D or weight in analyses.</p>
<p>Jacobs DR Jr, Meyer KA, Kushi LH, Folsom AR. Whole-grain intake may reduce the risk of ischemic heart disease death in postmenopausal women: The Iowa Women's Health Study. <i>Am J Clin Nutr</i>. 1998 Aug; 68 (2): 248-257. PMID: 9701180.</p>	<p>For CVD question: Included in De Moura, 2009. Does not include T2D or weight in analyses.</p>
<p>Jacobs DR Jr, Meyer HE, Solvoll K. Reduced mortality among whole grain bread eaters in men and women in the Norwegian County Study. <i>Eur J Clin Nutr</i>. 2001 Feb; 55 (2): 137-143. PMID:11305627.</p>	<p>Does not include outcomes of interest in analyses.</p>
<p>Jenkins DJ, Kendall CW, McKeown-Eyssen G, Josse RG, Silverberg J, Booth GL, Vidgen E, Josse AR, Nguyen TH, Corrigan S, Banach MS, Ares S, Mitchell S, Emam A, Augustin LS, Parker TL, Leiter LA. Effect of a low-glycemic index or a high-cereal fiber diet on type 2 diabetes: A randomized trial. <i>JAMA</i>. 2008 Dec 17; 300 (23): 2, 742-2, 753. PMID: 19088352.</p>	<p>Study subjects had T2D.</p>
<p>Jensen MK, Koh-Banerjee P, Hu FB, Franz M, Sampson L, Grønbaek M, Rimm EB. <u>Intakes of whole grains, bran, and germ and the risk of coronary heart disease in men</u>. <i>Am J Clin Nutr</i>. 2004 Dec; 80(6): 1, 492-1, 499.</p>	<p>For CVD question: Included in De Moura, 2009. Does not include T2D or weight in analyses.</p>
<p>Johnsen NF, Hausner H, Olsen A, Tetens I, Christensen J, Knudsen KE, Overvad K, Tjønneland A. <u>Intake of whole grains and vegetables determines the plasma enterolactone concentration of Danish women</u>. <i>J Nutr</i>. 2004 Oct; 134 (10): 2, 691-2, 697.</p>	<p>Study design is cross-sectional.</p>
<p>Katcher HI, Legro RS, Kunselman AR, Gillies PJ, Demers LM, Bagshaw DM, Kris-Etherton PM. <u>The effects of a whole grain-enriched hypocaloric diet on cardiovascular disease risk factors in men and women with metabolic syndrome</u>. <i>Am J Clin Nutr</i>. 2008 Jan; 87(1): 79-90.</p>	<p>Study subjects had hyperlipidemia.</p>

<p>Katz DL, Evans MA, Chan W, Nawaz H, Comerford BP, Hoxley ML, Njike VY, Sarrel PM. Oats, antioxidants and endothelial function in overweight, dyslipidemic adults. <i>J Am Coll Nutr.</i> 2004 Oct; 23 (5): 397-403.</p>	<p>Study subjects had hyperlipidemia.</p>
<p>Koh-Banerjee P, Franz M, Sampson L, Liu S, Jacobs DR Jr, Spiegelman D, Willett W, Rimm E. Changes in whole-grain, bran, and cereal fiber consumption in relation to 8-year weight gain among men. <i>Am J Clin Nutr.</i> 2004 Nov; 80 (5): 1, 237-1, 245.</p>	<p>Does not include CHD or T2D in analyses. For weight question, included in systematic review, Williams, 2008.</p>
<p>Kuriyan R, Gopinath N, Vaz M, Kurpad AV. Use of rice bran oil in patients with hyperlipidaemia. <i>Natl Med J India.</i> 2005 Nov-Dec; 18 (6): 292-296.</p>	<p>Does not include whole grain in analyses. Study subjects had hyperlipidemia.</p>

Article (L-S)	Reason for Exclusion
<p>Lairon D, Arnault N, Bertrais S, Planells R, Clero E, Hercberg S, Boutron-Ruault MC. Dietary fiber intake and risk factors for cardiovascular disease in French adults. <i>Am J Clin Nutr.</i> 2005 Dec; 82 (6): 1, 185-1, 194.</p>	<p>Does not include whole grain in analyses.</p>
<p>Lammert A, Kratzsch J, Selhorst J, Humpert PM, Bierhaus A, Birck R, Kusterer K, Hammes HP. Clinical benefit of a short term dietary oatmeal intervention in patients with type 2 diabetes and severe insulin resistance: A pilot study. <i>Exp Clin Endocrinol Diabetes.</i> 2008 Feb; 116 (2): 132-134. Epub 2007 Dec 20. PMID: 18095234.</p>	<p>Study subjects had T2D.</p>
<p>Landberg R, Kamal-Eldin A, Andersson A, Vessby B, Aman P. Alkylresorcinols as biomarkers of whole-grain wheat and rye intake: Plasma concentration and intake estimated from dietary records. <i>Am J Clin Nutr.</i> 2008 Apr; 87 (4): 832-838.</p>	<p>Does not answer questions. Examined biomarkers of whole grain wheat and rye intake.</p>
<p>Lee KW, Song KE, Lee HS, Kim YK, Lee SW, Kim DJ, Hwang WS, Choe SJ, Kim YS, Kim TY. The effects of Goami No. 2 rice, a natural fiber-rich rice, on body weight and lipid metabolism. <i>Obesity</i> (Silver Spring). 2006 Mar; 14(3): 423-430.</p>	<p>Does not include incident T2D or T2D in analyses. Examined experimental Goami rice.</p>
<p>Linko AM, JuntunenKS, Mykkänen HM, Adlercreutz H. Whole-grain rye bread consumption by women correlates with plasma alkylresorcinols and increases their concentration compared with low-fiber wheat bread. <i>J Nutr.</i> 2005 Mar; 135 (3):</p>	<p>Does not answer questions. Examined biomarkers of whole grain wheat and rye intake.</p>

Linko-Parvinen AM, Landberg R, Tikkannen MJ, Adlercreutz H, Peñalvo JL. Alkylresorcinols from whole-grain wheat and rye are transported in human plasma lipoproteins . <i>J Nutr.</i> 2007 May; 137 (5): 1, 137-1, 142.	Does not answer questions. Examined biomarkers of whole-grain wheat and rye intake.
Liu S, Manson JE, Stampfer MJ, Hu FB, Giovannucci E, Colditz GA, Hennekens CH, Willett WC. A prospective study of whole-grain intake and risk of type 2 diabetes mellitus in US women. <i>Am J Public Health.</i> 2000 Sep; 90 (9): 1, 409-1, 415. PMID: 10983198; PMCID: PMC1447620.	Included in systematic reviews: For CVD question: DeMoura, 2009. For T2D Question: de Munter, 2007 and Priebe, 2008.
Liu S, Sesso HD, Manson JE, Willett WC, Buring JE. Is intake of breakfast cereals related to total and cause-specific mortality in men? <i>Am J Clin Nutr.</i> 2003 Mar; 77 (3): 594-599. PMID: 12600848.	Does not include T2D or weight in analyses. For CVD question: Included in DeMoura, 2009 systematic review.
Liu S, Stampfer MJ, Hu FB, Giovannucci E, Rimm E, Manson JE, Hennekens CH, Willett WC. Whole-grain consumption and risk of coronary heart disease: Results from the Nurses' Health Study . <i>Am J Clin Nutr.</i> 1999 Sep; 70 (3): 412-419.	For CVD question: Included in DeMoura, 2009 systematic review. Does not include T2D or weight in analyses.
Lu Z, Kou W, Du B, Wu Y, Zhao S, Brusco OA, Morgan JM, Capuzzi DM; Chinese Coronary Secondary Prevention Study Group, Li S. Effect of Xuezhikang, an extract from red yeast Chinese rice, on coronary events in a Chinese population with previous myocardial infarction . <i>Am J Cardiol.</i> 2008 Jun 15; 101 (12): 1, 689-1, 693. Epub 2008 Apr 11.	Does not answer questions. examined the effects of an Study subjects were post myocardial infarction
Maki KC, Davidson MH, Witchger MS, Dicklin MR, Subbaiah PV. Effects of high-fiber oat and wheat cereals on postprandial glucose and lipid responses in healthy men . <i>Int J Vitam Nutr Res.</i> 2007 Sep; 77 (5): 347-356	Does not answer questions. Measured postprandial response.
McKeownNM. Whole grain intake and insulin sensitivity: evidence from observational studies . <i>Nutr Rev.</i> 2004 Jul; 62 (7 Pt 1): 286-291. Review.	Publication is a narrative review.
Melanson KJ, Angelopoulos TJ, Nguyen VT, Martini M, Zukley L, Lowndes J, Dube TJ, Fiutem JJ, Yount BW, Rippe JM. Consumption of whole-grain cereals during weight loss: Effects on dietary quality, dietary fiber, magnesium, vitamin B-6, and obesity . <i>J Am Diet Assoc.</i> 2006 Sep; 106 (9): 1, 289-1, 289; quiz 1, 289-1, 290.	Does not examine incident T2D or CHD. Examined weight loss. Included in Harland/Garton 2007 systematic review for weight question.

<p>Mellen PB, Liese AD, Tooze JA, Vitolins MZ, Wagenknecht LE, Herrington DM. <u>Whole-grain intake and carotid artery atherosclerosis in a multiethnic cohort: The Insulin Resistance Atherosclerosis Study.</u> <i>Am J Clin Nutr.</i> 2007 Jun; 85 (6): 1, 495-1, 502.</p>	<p>Does not examine incident T2D or weight. Study examined carotid intimal medial thickness, not CVD outcome of interest.</p>
<p>Merchant AT, Pitiphat W, Franz M, Joshipura KJ. <u>Whole-grain and fiber intakes and periodontitis risk in men.</u> <i>Am J Clin Nutr.</i> 2006 Jun; 83 (6):1395-400.</p>	<p>Does not examine outcomes of interest. Study examines periodontitis.</p>
<p>Mesci B, Oguz A, Sagun HG, Uzunlulu M, Keskin EB, Coksert D. <u>Dietary breads: Myth or reality?</u> <i>Diabetes Res Clin Pract.</i> 2008 Jul; 81 (1): 68-71. Epub 2008 Mar 26.</p>	<p>Study subjects were type 2 diabetics.</p>
<p>Meyer KA, Kushi LH, Jacobs DR Jr, Slavin J, Sellers TA, Folsom AR. Carbohydrates, dietary fiber, and incident type 2 diabetes in older women. <i>Am J Clin Nutr.</i> 2000 Apr; 71 (4): 921-930. PMID:10731498.</p>	<p>For T2D question, included in systematic reviews, de Munter, 2007 and Priebe, 2008. Does not include CHD or weight in analyses.</p>
<p>Montonen J, Knekt P, Järvinen R, Aromaa A, Reunanen A. Whole-grain and fiber intake and the incidence of type 2 diabetes. <i>Am J Clin Nutr.</i> 2003 Mar; 77 (3): 622-629. PMID: 12600852</p>	<p>For T2D question, included in systematic reviews, de Munter, 2007 and Priebe, 2008. Does not include CHD or weight in analyses.</p>
<p>Mozaffarian D, KumanyikaSK, Lemaitre RN, Olson JL, Burke GL, Siscovick DS. Cereal, fruit, and vegetable fiber intake and the risk of cardiovascular disease in elderly individuals. <i>JAMA.</i> 2003 Apr 2; 289 (13): 1, 659-1, 666. PMID: 12672734.</p>	<p>Did include whole grain intake in analyses.</p>
<p>Murtaugh MA, Jacobs DR Jr, Jacob B, Steffen LM, Marquart L. Epidemiological support for the protection of whole grains against diabetes. <i>Proc Nutr Soc.</i> 2003 Feb; 62 (1): 143-149. Review. PMID: 12740069.</p>	<p>Publication is a narrative review.</p>
<p>Newby PK, Maras J, Bakun P, Muller D, Ferrucci L, Tucker KL. <u>Intake of whole grains, refined grains, and cereal fiber measured with seven-day diet records and associations with risk factors for chronic disease.</u> <i>Am J Clin Nutr.</i> 2007 Dec; 86 (6): 1, 745-1, 753. PMID: 18065595; PMCID: PMC2646086.</p>	<p>Included in systematic reviews: For weight question, Williams, 2008; for CHD, DeMoura, 2009.</p>

<p>Nilsson AC, Ostman EM, Granfeldt Y, Björck IM. <u>Effect of cereal test breakfasts differing in glycemic index and content of indigestible carbohydrates on daylong glucose tolerance in healthy subjects.</u> <i>Am J Clin Nutr.</i> 2008 Mar; 87(3): 645-654. PMID: 18326603.</p>	<p>Does not examine incident T2D. Measures glucose tolerance following 24-hour intervention.</p>
<p>Nilsson AC, Ostman EM, Holst JJ, Björck IM. <u>Including indigestible carbohydrates in the evening meal of healthy subjects improves glucose tolerance, lowers inflammatory markers, and increases satiety after a subsequent standardized breakfast.</u> <i>J Nutr.</i> 2008 Apr; 138 (4): 732-739.</p>	<p>Does not examine incident T2D. Measures postprandial response.</p>
<p>Panahi S, Ezatagha A, Temelli F, Vasanthan T, Vuksan V. <u>Beta-glucan from two sources of oat concentrates affect postprandial glycemia in relation to the level of viscosity.</u> <i>J Am Coll Nutr.</i> 2007 Dec; 26(6): 639-644.</p>	<p>Does not examine incident T2D, CVD or weight. Postprandial study.</p>
<p>Panlasigui LN, Thompson LU. <u>Blood glucose lowering effects of brown rice in normal and diabetic subjects.</u> <i>Int J Food Sci Nutr.</i> 2006 May-Jun; 57(3-4): 151-158.</p>	<p>Does not include incident T2D, CVD or weight in analyses.</p>
<p>Qi L, Hu FB. <u>Dietary glycemic load, whole grains, and systemic inflammation in diabetes: The epidemiological evidence.</u> <i>Curr Opin Lipidol.</i> 2007 Feb; 18 (1): 3-8.</p>	<p>Publication is a narrative review.</p>
<p>Qi L, van Dam RM, Liu S, Franz M, Mantzoros C, Hu FB. <u>Whole-grain, bran, and cereal fiber intakes and markers of systemic inflammation in diabetic women.</u> <i>Diabetes Care.</i> 2006 Feb; 29 (2): 207-211.</p>	<p>Study design is cross-sectional. Study subjects had T2D.</p>
<p>Rave K, Roggen K, Dellweg S, Heise T, tom Dieck H. <u>Improvement of insulin resistance after diet with a whole-grain based dietary product: Results of a randomized, controlled cross-over study in obese subjects with elevated fasting blood glucose.</u> <i>Br J Nutr.</i> 2007 Nov; 98 (5): 929-936. Epub 2007 Jun 12.</p>	<p>Study subjects had elevated fasting blood glucose.</p>
<p>Sadiq Butt M, Tahir-Nadeem M, Khan MK, Shabir R, Butt MS. <u>Oat: unique among the cereals.</u> <i>Eur J Nutr.</i> 2008 Mar; 47 (2): 68-79. Epub 2008 Feb 26.</p>	<p>Publication is a narrative review.</p>

Sahyoun NR, Jacques PF, Zhang XL, Juan W, McKeown NM. Whole-grain intake is inversely associated with the metabolic syndrome and mortality in older adults . <i>Am J Clin Nutr.</i> 2006 Jan; 83 (1): 124-131.	Study design is cross-sectional.
Seal CJ, Brownlee IA, Jones AR. Grains and health: the "whole" picture . <i>Quintessence Int.</i> 2007 Jun; 38 (6): 498-503. PMID: 17625633.	Publication is a narrative review.
Seal CJ. Whole grains and CVD risk. <i>Proc Nutr Soc.</i> 2006 Feb; 65 (1): 24-34. Review. PMID: 16441941.	Publication is a narrative review.
Shimizu C, Kihara M, Aoe S, Araki S, Ito K, Hayashi K, Watari J, Sakata Y, Ikegami S. Effect of high beta-glucan barley on serum cholesterol concentrations and visceral fat area in Japanese men: A randomized, double-blinded, placebo-controlled trial . <i>Plant Foods Hum Nutr.</i> 2008 Mar; 63 (1): 21-25. Epub 2007 Dec 12.	Study subjects had hypercholesterolemia.
Smith KN, Queenan KM, Thomas W, Fulcher RG, Slavin JL. Physiological effects of concentrated barley beta-glucan in mildly hypercholesterolemic adults. <i>J Am Coll Nutr.</i> 2008 Jun; 27 (3): 434-440. PMID: 18838533.	Study subjects had hypercholesterolemia.
Steffen LM, Jacobs DR Jr, Stevens J, Shahar E, Carithers T, Folsom AR. Associations of whole-grain, refined-grain, and fruit and vegetable consumption with risks of all-cause mortality and incident coronary artery disease and ischemic stroke: The Atherosclerosis Risk in Communities (ARIC) Study . <i>Am J Clin Nutr.</i> 2003 Sep; 78 (3): 383-390.	Included in systematic reviews: For CVD question DeMoura, 2009. For Weight question Harland/Garton 2007. Does not include T2D in analyses.

Article (T-Z)	Reason for Exclusion
Thane CW, Jones AR, Stephen AM, Seal CJ, Jebb SA. Comparative whole-grain intake of British adults in 1986-1987 and 2000-2001 . <i>Br J Nutr.</i> 2007 May; 97 (5): 987-992.	Does not answer questions. Study reports dietary intake of whole grains.
Thane CW, Jones AR, Stephen AM, Seal CJ, Jebb SA. Whole-grain intake of British young people aged four-18 years . <i>Br J Nutr.</i> 2005 Nov; 94 (5): 825-831.	Study design is cross-sectional. Does not answer questions. Reports dietary intake of whole grains.

<p>Thane CW, Stephen AM, Jebb SA. Whole grains and adiposity: Little association among British adults. <i>Eur J Clin Nutr</i>. 2009 Feb; 63 (2): 229-237. Epub 2007 Sep 19. PMID: 17882134.</p>	<p>Included in systematic review for weight: Harland/Garton 2007. Does not include CVD or T2D in analyses.</p>
<p>Theuwissen E, Plat J, Mensink RP. Consumption of oat beta-glucan with or without plant stanols did not influence inflammatory markers in hypercholesterolemic subjects. <i>Mol Nutr Food Res</i>. 2009 Mar; 53 (3): 370-376. PMID: 18979504.</p>	<p>Study subjects had hypercholesterolemia.</p>
<p>van Dam RM, Hu FB, Rosenberg L, Krishnan S, Palmer JR. Dietary calcium and magnesium, major food sources, and risk of type 2 diabetes in US black women. <i>Diabetes Care</i>. 2006 Oct; 29 (10): 2, 238-2, 243. Erratum in: <i>Diabetes Care</i>. 2008 Oct; 31(10): 2, 077. PMID: 17003299.</p>	<p>Included in systematic reviews for T2D: de Munter, 2007 and Priebe, 2008. Does not include CVD or weight in analyses.</p>
<p>Vuksan V, Whitham D, Sievenpiper JL, Jenkins AL, Rogovik AL, Bazinet RP, Vidgen E, Hanna A. Supplementation of conventional therapy with the novel grain Salba (<i>Salvia hispanica L.</i>) improves major and emerging cardiovascular risk factors in type 2 diabetes: Results of a randomized controlled trial. <i>Diabetes Care</i>. 2007 Nov; 30 (11): 2, 804-2, 810. Epub 2007 Aug 8.</p>	<p>Study subjects diagnosed with T2D.</p>
<p>Wang L, Gaziano JM, Liu S, Manson JE, Buring JE, Sesso HD. Whole- and refined-grain intakes and the risk of hypertension in women. <i>Am J Clin Nutr</i>. 2007 Aug; 86 (2): 472-479. PMID: 17684221.</p>	<p>Included in systematic review for CVD question: DeMoura, 2009. Does not include T2D or weight in analyses.</p>
<p>Weickert MO, Möhlig M, Schöfl C, Arafat AM, Otto B, Viehoff H, Koebnick C, Kohl A, Spranger J, Pfeiffer AF. Cereal fiber improves whole-body insulin sensitivity in overweight and obese women. 2006 Apr; 29 (4): 775-780.</p>	<p>Study examines effect of cereal fiber intake, not whole grain.</p>
<p>Yannakoulia M, Yiannakouris N, Melistas L, Kontogianni MD, Malagaris I, Mantzoros CS. A dietary pattern characterized by high consumption of whole-grain cereals and low-fat dairy products and low consumption of refined cereals is positively associated with plasma adiponectin levels in healthy women. <i>Metabolism</i>. 2008 Jun; 57 (6): 824-830.</p>	<p>Study design is cross-sectional. Outcome was adiponectin.</p>
<p>Zhang HW, Zhang YH, Lu MJ, Tong WJ, Cao GW. Comparison of hypertension, dyslipidaemia and hyperglycaemia between buckwheat seed-consuming and non-consuming Mongolian-Chinese populations in Inner Mongolia, China. <i>Clin Exp</i></p>	<p>Study design was cross-sectional.</p>

Pharmacol Physiol. 2007 Sep; 34 (9): 838-844.
PMID: 17645626.